STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
PACIFIC CASCADE REGION

BRIGHT IDEA HARDWOOD

ROAD PLAN

SECTION 24, 25, TOWNSHIP 12 NORTH, RANGE 01 EAST, W.M.
LEWIS COUNTY

LEWIS DISTRICT

AGREEMENT NO.: 30-076147

CONTRACT ADMINISTRATOR: Meg Wallmow

DATE: 04/01/2004

STAFF ENGINEER: Matthew T. Miskovic

DRAWN & COMPILED BY: Alicia Compton

SECTION 0 – SCOPE OF PROJECT

This project includes but is not limited to construction and optional construction including:

clearing;
grubbing;
right-of-way debris disposal;
excavation and/or embankment to subgrade;
landing construction;
acquisition and installation of drainage structures;
acquisition, manufacture, and application of rock;
gate installation;
landing deactivation;
grass seeding.

This project also includes but is not limited to reconstruction and optional reconstruction including:

clearing existing excavation and embankment slopes;
right-of-way debris disposal;
acquisition and installation of portable bridge;
acquisition and installation of 108"x 48' culvert;
acquisition and installation of additional drainage structures;
acquisition, manufacture, and application of rock.

This project also includes but is not limited to abandonment including:

light abandonment;
medium abandonment.

SECTION 1 - GENERAL CLAUSES

1.1-1
Clauses in this plan apply to all construction or reconstruction including landings unless otherwise noted.

1.1-2
Construction or reconstruction of the following roads is required. All roads shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
W-1300	0+00 to 79+50	Reconstruction
	91+00 to 97+00	Reconstruction
	102+25 to 117+35	Reconstruction
W-1300 Ext.	0+00 to 18+44	Construction

1.1-3

Construction or reconstruction of the following roads is not required. Roads used by the Purchaser shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

Road	Stations	Type
W-1300 Ext.	18+44 to 41+30	Construction
W-1307	0+00 to 5+77	Construction
W-1308	0+00 to 8+26	Construction
W-1309	0+00 to 3+00	Construction
W-1390	0+00 to 13+71	Reconstruction
W-1395	0+00 to 5+16	Construction

1.1-4

If the Purchaser desires a road location or design change, a revised Road Plan shall be submitted to the State for consideration.

1.1-5

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.1-10

Abandonment of the following roads is required. All roads shall be abandoned in accordance with this Road Plan.

Road	Stations	Type
W-1300 Ext.	18+45 to 41+30	Medium
W-1308	0+00 to 8+26	Light
W-1309	0+00 to 3+00	Light

1.2-1

The construction or reconstruction of any roads specified herein shall not be permitted between September 30 and May 1 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-2

Purchaser shall not use roads constructed or reconstructed under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-6

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culvert placement in live streams shall precede embankment where culverts are to be placed along natural ground.
Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, and culvert installations shall be completed and are subject to written approval by the Contract Administrator prior to rock application.

1.3-2

Hauling shall be suspended when wheel track rutting exceeds 6 inches unless Purchaser elects to correct the situation at his/her own expense. Corrective measures and continued operations are subject to written approval by the Contract Administrator.

1.4-2

The following roads shall be reconstructed in accordance with construction stakes.

Road	Stations
W-1300	76+63 to 78+83
W-1300	92+14 to 95+42

1.4-3

Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

SECTION 2 - CLEARING

2.1-1

Fell all vegetative material larger than 2 inches DBH or over 5 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

SECTION 3 - GRUBBING

3-1

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.

3-2

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1

Right-of-way debris is defined as all nonmerchantable vegetative material larger than one cubic foot in volume within the grubbing limits.

4.1-2

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-1

Right-of-way debris shall be scattered outside the grubbing limits.

4.2.3-2

Right-of-way debris shall not be placed against standing timber.

SECTION 5 - EXCAVATION

5.1-1

Roads shall be constructed or reconstructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-3

Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are: 18 percent favorable and 12 percent adverse. Minimum radius curve is 60 feet.

5.1-4

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

5.1-5

Curve widening, where required, shall be added to the inside of curves.

5.1-7

Roads shall be constructed or reconstructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

Tolerance Class	A	B	C
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8

Excavation slopes shall be constructed no steeper than shown on the following table:

Material Type	Excavation Slope Ratio
Common Earth (on side slopes of 55%)	1:1
Common Earth (55% to 70% sideslopes)	¾:1
Common Earth (on slopes over 70%)	½:1
Fractured or loose rock	½:1
Hardpan or solid rock	¼:1

5.1-9

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier revegetation.

5.1-10

Embankments shall be widened as follows:

Height at Centerline	Subgrade Widening
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11

Embankment slopes shall be constructed no steeper than shown on the following table, except as construction staked or designed:

Material Type	Embankment Slope Ratio
Common Earth and Rounded Gravel	1½:1
Angular Rock	1¼:1
Sandy Soils	2:1

5.1-12

Organic material shall be excluded from embankment.

5.1-18

Turnarounds shall be no larger than 30 feet long and 30 feet wide. Location shall be subject to written approval of the Contract Administrator.

5.1.1-1

Waste material shall not be deposited within 50 feet of a cross drain culvert installation.

5.1.1-3

Waste material may be deposited adjacent to the road prism on side slopes up to 45 percent if the waste material is compacted and more than 100 feet away from live streams. On side slopes of 45 percent or more, all excavation shall be end hauled or pushed to designated embankment sites.

5.1.1-7

On the following roads, all excess excavated material shall be end hauled to designated waste areas.

End Haul/Waste Material Disposal

Road	Stations	Waste Area Location	Remarks
W-1300	76+63 to 78+83 92+14 to 95+42	63+50 to 65+30 of W-1300 Rd	West side of road

5.1.1-8

The amount of material to be contained in a waste area shall be at the discretion of the Contract Administrator.

5.1.2-1

Select borrow shall contain no more than 5% dirt, vegetative debris, or other waste material by volume.

5.1.2-2

Select borrow shall be used at the following location:

Road	Stations	Source
W-1300	76+63 to 78+83 92+14 to 95+42	Jupe Quarry

5.2-1

Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the grubbing limits, or restrict drainage.

5.3-3

Embankments shall be compacted in lifts not to exceed 24 inches. Compaction shall consist of three coverages over the entire width of each lift with a vibratory drum roller weighing a minimum of 14,000 pounds at a maximum operating speed of 3 mph. For embankment segments too narrow to accommodate a drum roller, a plate compactor shall be used. With a plate compactor three full coverages shall be made in 12 inch lifts.

5.4-1

Silt-bearing runoff shall not be permitted to go into streams.

5.4-2

Accomplish sediment removal through silt traps, silt fences, settling ponds, or other methods as approved, in writing, by the Contract Administrator.

5.4-3.1

On the following roads, Purchaser shall furnish and evenly spread the seed mixture listed below on all exposed soil inside the grubbing limits at a rate of 40 pounds per acre. The date of application is subject to approval by the Contract Administrator.

Mixture Percent by Weight	Minimum Percent Germination
50% Fescue, Red	90% Germination
25% Ryegrass, Perennial	90% Germination
15% Bentgrass	85% Germination
10% Clover, White and White Dutch (inoculated)	90% Germination

Weed seed shall not exceed 0.5% by weight.

Seed shall be furnished in standard containers on which the following shall be shown:

1. Common name of seed
2. Net weight
3. Percent of purity
4. Percentage of germination
5. Percentage of weed seed and inert material

Required seed not spread by the termination of this contract shall become property of the State.

Road	Stations	Seed Quantity (lbs)
W-1300	63+50 to 65+30 (waste area)	50
	76+63 to 79+50	25
	91+00 to 97+00	25
W-1300 Ext.	0+00 to 18+44	75
	18+44 to 41+30	90
W-1307	0+00 to 5+77	20
W-1308	0+00 to 8+26	30
W-1309	0+00 to 3+00	10
W-1390	0+00 to 13+71	50
W-1395	0+00 to 5+16	20

5.4-8

On the following roads, accomplish sediment removal through settling ponds as illustrated on the SETTLING POND DETAIL. Purchaser shall clean out settling pond as directed by the Contract Administrator.

Road	Station	Remarks
W-1300	91+63	Left side

5.5-4

Constructed or reconstructed subgrades shall be compacted full width except ditch prior to rock application. Compaction shall be by a smooth-drum vibratory roller weighing at least 14,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

5.5-5

Finished subgrade shall be crowned as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

6.2.1-1

Purchaser shall furnish, install, and maintain corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) and on culverts over 24 inches, aluminized culverts (meeting ASTM A 819, AASHTO M-274 aluminized steel Type 2 and AASHTO M-36 specifications) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-2

Annular corrugated bands and culvert ends shall be used on metal culverts. On culverts 24 inches and smaller, bands shall have a minimum width of 12 inches, on culverts over 24 inches, bands shall have a minimum width of 24 inches. Manufacturer's approved connectors shall be used for corrugated polyethylene pipe.

6.2.1-5

On required roads: culverts, downspouts, flumes, bands, and gaskets as listed on the CULVERT LIST which are not installed shall become property of the State.

6.2.1-7

On the following roads, installation of culvert or bridge shall be in accordance with Hydraulics Project Approval and CULVERT INSTALLATION DETAIL.

Road	Stations
W-1300	78+30
W-1300	94+00

6.2.2.1-1

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the Corrugated Polyethylene Pipe Association "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."

6.2.2.1-2

Purchaser shall provide rubberized gaskets for all culverts with a vertical rise greater than 42 inches.

6.2.2.3-1

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except that cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.4-1

Installations of culverts 30 inches in diameter and over shall be subject to written approval by the Region Engineer or their designee prior to making backfill.

6.2.2.5-1

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.4-1

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts except for temporary culverts.

SECTION 7 - ROCK

7.1-1

Rock for construction and/or reconstruction under this contract may be obtained from a source on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with a written "Development Plan" prepared by the State. A copy of the written plan is available upon request from the Pacific Cascade Region office. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plan shall be developed. All parties shall follow this plan.

Source	Location
Jupe Quarry	Sec. 32, T12N, R02E, W.M.

7.1-6

Rock for construction or reconstruction under this contract may be obtained from any commercial source as approved in writing by the Contract Administrator.

7.2.1-4

Rock shall meet the following specifications for gradation and quality. The exact point of evaluation for conformance to specifications will be determined by the Contract Administrator.

7.2.1.1-3

1 ½ INCH MINUS CRUSHED ROCK

% passing 1 ½" square sieve	100%
% passing 1" square sieve	70 - 90%
% passing 5/8" square sieve	50 - 80%
% passing ¼" square sieve	30 - 50%
% passing U.S. #40 sieve	3 - 18%
% passing U.S. #200 sieve	7.5% Max.

All percentages are by weight.

7.2.1.1-5

2 ½ INCH MINUS CRUSHED ROCK

% passing 2 ½" square sieve	100%
% passing 2" square sieve	65 -100%
% passing 1" square sieve	50 - 70%
% passing ¼" square sieve	30 - 50%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-6
3 INCH MINUS CRUSHED ROCK

% passing 3" square sieve	100%
% passing 2" square sieve	65 - 95%
% passing ¾" square sieve	28 - 70%
% passing ¼" square sieve	10 - 35%
% passing U.S. #200 sieve	0 - 10%

All percentages are by weight.

7.2.1.1-10
8 INCH PLUS ROCK

% equal to, or larger in one dimension than the specified size	100%
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-11
QUARRY SPALLS

% passing 8" square sieve	100%
% passing 3" square sieve	40% Max.
% passing ¾" square sieve	10% Max.
% passing U.S. #40 sieve	16% Max.
% passing U.S. #200 sieve	5% Max.

All percentages are by weight.

7.2.1.1-12
Landing rock shall be no coarser than 6 INCH MINUS.

7.2.1.2-2
Pit run rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash.

7.2.3-1
Measurement of the rock shall be on a cubic yard truck measure basis. Each truck box shall be measured by the Contract Administrator prior to rock hauling. The Contract Administrator shall periodically require that a load be flattened off and its volume calculated. An average of such volumes for each truck shall be used to tally the volume to be hauled. The Purchaser shall provide and maintain load tally sheets for each truck and shall give them to the Contract Administrator upon request.

7.4.2-1
Apply at least the minimum required rock quantity as shown on the ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-4
On the following roads, if hauling shall take place only from May 1 to September 30, Purchaser may not be required to place or provide the optional rock in the ROCK LIST. Purchaser shall then be required to submit a written plan for approval by the Contract Administrator describing how these roads shall be constructed, used, and abandoned in compliance with all other clauses in the ROAD PLAN.

Road	Stations
W-1307	0+00 to 5+07
W-1308	0+00 to 8+26
W-1309	0+00 to 3+00
W-1390	5+80 to 13+71
W-1395	0+00 to 5+16

7.4.2-9

Turnarounds, turnouts, and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-10

Each lift of rock shall be crowned as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.2-11

On the following road, Purchaser shall spot patch as directed by the Contract Administrator in accordance with quantities shown on ROCK LIST.

Road	Stations
W-1300	0+00 to 63+50

7.4.3-1

Rock shall be mixed, compacted, and graded in sections not to exceed ½ mile in length. Water shall be added in quantities to facilitate compaction. If directed by the Contract Administrator, a minimum of 6 gallons of water per cubic yard of rock shall be applied.

7.4.3-2

Rock shall be spread and compacted full width in lifts each not to exceed 15 inches uncompacted depth. Compaction shall be by smooth drum vibratory roller weighing at least 14,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

7.4.4-1

Riprap shall consist of angular stone, placed on slopes as indicated in this plan or as directed by the Contract Administrator.

Loose Riprap - The stone for loose riprap shall be hard, sound and durable. It shall be free from segregation, seams, cracks, and other defects tending to destroy its resistance to weather. Loose riprap shall be free of rock fines, soil, or other extraneous material.

a. Heavy Loose Riprap - Shall meet the following requirements for grading:

At Least/Not More Than	Minimum Size	Maximum Size
40% / 90%	1 Ton (1/2 cu. yd.)	--
70% / 90%	300 lbs. (2 cu. ft.)	--
10% / 30%	--	50 lbs.

b. Light Loose Riprap - Shall meet the following requirements for grading:

At Least/Not More Than	Size Range	Maximum Size
20% / 90%	300 lbs. to 1 ton	--
80% / --	50 lbs. to 1 ton	--
10% / 20%	--	50 lbs.

7.4.4-2

Riprap shall be set in place in conjunction with construction of the embankment. Placement shall be by zero drop height methods only.

8.3-2

Purchaser shall supply and install a portable steel bridge as listed below. Bridge listed below shall be constructed of steel. Bridges shall be designed by a professional structural engineer licensed in the State of Washington. The design Engineer shall be responsible for ensuring that all materials and procedures used during construction comply with the design. The design Engineer shall notify the Contract Administrator in writing that all elements of each of the following construction stages are in conformance with the design before allowing construction to continue on to the next stage.

a. Footing forms, iron work, and concrete, including piling, if any.
b. Abutment forms, iron work, and concrete.
c. Cap forms, iron work, concrete, and/or placement.
d. Superstructure forms, iron work, concrete, or placement.
e. Deck forms, iron work, concrete, or placement.

Road	Station	Length	Loading	W.B.W.G.*	Vert.Clear*
W-1300	94+00	32'	HL-93	16'	5

*W.B.W.G. = Width between wheel guards
*Vertical clearance shall be measured from 100 year flood level.
P.P. = On the attached plan/profile
C.S. = According to construction stakes on the ground.

8.3-2.1

Bridges shall be installed according to BRIDGE INSTALLATION DETAIL and meet the following specifications:

Composed of two modular sections ;
When sections are stacked for transportation, overall width shall not exceed 10'-10";
Full width running planks;
15" high guard rails;
w-beam guard rails and terminal ends in compliance with Washington State Department of Transportation Standard Plans 2002;
Paint in accordance with clause 8.3-2.2;
Galvanized sheet piling backwall.

8.3-2.2

All paint products used on this project shall be manufactured by the same manufacturer and be compatible with one another. Paint supplied for this project shall conform to the following minimum requirements:

1. Primer

Generic Type:	Zinc filled, single component, moisture-cured polyurethane
Vehicle Type:	Moisture-cured polyurethane
Volume Solids:	60% minimum
Pigment Type:	Zinc Dust
Coverage:	3 mils DFT minimum
VOC:	Not to exceed 2.8 lbs/gal

2. Intermediate Coat

Generic Type:	Refined coal tar/Micaceous Iron Oxide-filed, single component, moisture-cured polyurethane
Vehicle Type:	Moisture-cured polyurethane
Volume Solids:	60% minimum
Pigment Type:	4.0 lbs/gal of Micaceous Iron Oxide minimum
Color:	Black
Coverage:	4 mils DFT minimum
VOC:	Not to exceed 2.8 lbs/gal

8.3-2.2 continued

3. Shield (Top) Coat

Generic Type:	Refined coal tar/Micaceous Iron Oxide-filed, single component, moisture-cured polyurethane
Vehicle Type:	Moisture-cured polyurethane
Volume Solids:	60% minimum
Pigment Type:	3.0 lbs/gal of Micaceous Iron Oxide minimum
Color:	Dull Earth Tone
Coverage:	4 mils DFT minimum
VOC:	Not to exceed 2.8 lbs/gal

A pre-approved system conforming to the above specifications is manufactured by:

Wasser High-Tech Coatings Inc.
8041 S. 228 St. #103
Kent, WA 98032
(253)850-2967

8.4-3

On the following road, a gate will be supplied by the State and is available at the Cedar Creek Correction Facility located in Section 11, Township 16 North, Range 04 West, W.M. Purchaser shall transport the gate to the installation site and install the gate. Each post of the gate shall be anchored by 2 ½ cubic yards of concrete.

Road	Station
W-1300	76+60

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.2-1

Purchaser shall reduce or relocate landing debris, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

9.2-2

Purchaser shall provide for drainage of the landing surface as approved, in writing, by the Contract Administrator.

9.2-3

Landing embankments shall be sloped to original construction specifications.

SECTION 10 - ROAD AND LANDING ABANDONMENT

10.1-1

The following roads shall be abandoned by the Purchaser at the termination of use

Road	Stations	Type
W-1300 Ext.	18+45 to 41+30	Medium
W-1308	0+00 to 8+26	Light
W-1309	0+00 to 3+00	Light

10.1-2

Light Abandonment shall consist of:

constructing non-drivable water bars in conformance with the attached NON-DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet, or as marked in the field;
skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
keying water bars into ditchline;
ripping the surface to a minimum depth of 10 inches;
removing culverts from State Land;
removing ditch cross drain culverts and leaving the resulting trench open;
sloping all trench walls and approach embankments no steeper than 1.5:1;
grass seeding concurrently with abandonment and in accordance with Clause: 5.4-3A.

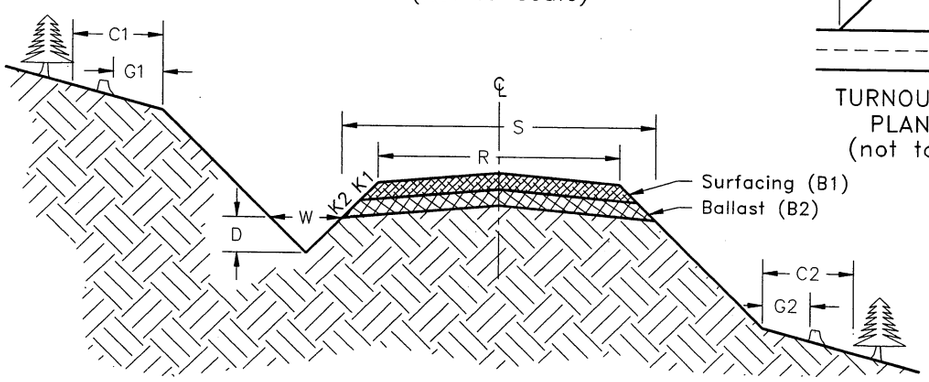
10.1-3

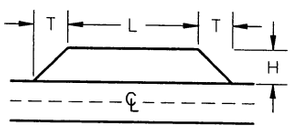
Medium Abandonment shall consist of:

filling the ditches;
ripping the surface to a minimum depth of 10 inches;
outsloping the surface at a minimum of 30%;
removing embankments, sidecast fill, and placing material into cutbanks and shaping banks to conform with natural ground;
constructing non-drivable water bars, as directed by Contract Administrator, in conformance with the attached NON-DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet, or as marked in the field;
skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
keying water bars into ditchline;
construction of tank trap barriers in conformance with the attached "T" TANK TRAP DETAIL;
removing culverts from State Land;
removing ditch cross drain culverts and leaving the resulting trench open;
sloping all trench walls and approach embankments no steeper than 1.5:1;
grass seeding concurrently with abandonment and in accordance with Clause: 5.4-3A;
covering, concurrently with abandonment, all exposed soils within 100 feet of any live stream, with a 8 inch deep layer of straw.

TYPICAL SECTION SHEET

ROAD CROSS-SECTION
(not to scale)





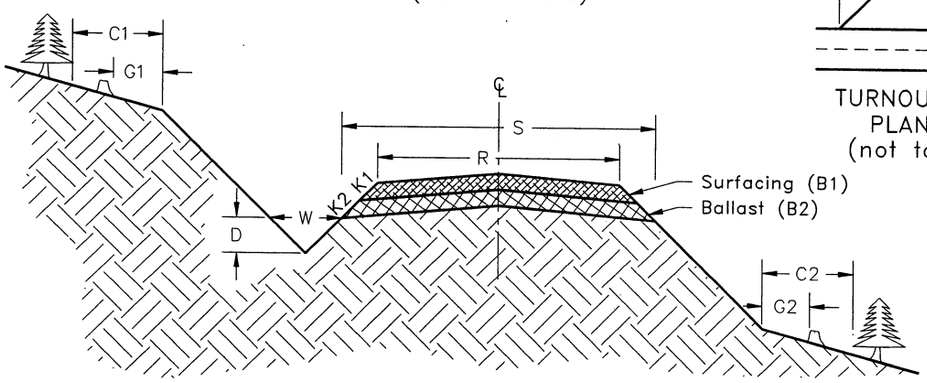
TURNOUT DETAIL
PLAN VIEW
(not to scale)

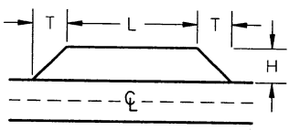
Road Number	From Station	To Station	Tolerance Class	Subgrade Width	Road Width	Ditch		Crown in. @ CL	Grubbing Limits		Clearing Limits	
						Width	Depth					
				S	R	W	D		G1	G2	C1	C2
W-1300	0+00	65+30	C	-	14'	-	-	4"	-	-	10'	10'
	65+30	76+63	C	-	14'	-	-	4"	-	-	-	-
	76+63	79-50	A	19'	14'	3'	1'	4"	-	-	-	-
	91+00	97+00	A	19'	14'	3'	1'	4"	-	-	-	-
	102+25	117+35	C	-	14'	3'	1'	4"	-	-	-	-
W-1300 Ext.	0+00	41+30	C	15'	12'	2'	1'	4"	3'	3'	5'	5'
W-1307	0+00	5+77	C	13'	10'	2'	1'	4"	3'	3'	5'	5'
W-1308	0+00	8+26	C	13'	10'	2'	1'	4"	3'	3'	5'	5'
W-1309	0+00	3+00	C	13'	10'	2'	1'	4"	3'	3'	5'	5'
W-1390	0+00	13+71	C	13'	10'	2'	1'	4"	3'	3'	5'	5'
W-1395	0+00	5+16	C	13'	10'	2'	1'	4"	3'	3'	5'	5'

ROCK LIST

BALLAST

ROAD CROSS-SECTION
(not to scale)





TURNOUT DETAIL
PLAN VIEW
(not to scale)

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout Length	Turnout Width	Turnout Taper
			K2	B2					L	H	T
						Heavy Loose Riprap		Jupe Quarry or any commercial source			
W-1300	78+30		Fill Slope Armor				240				
	94+00		Bridge Abutments				202				
	94+00		Fill Slope Armor				118				
						Light Loose Riprap		Jupe Quarry			
*W-1300	78+30		Stream Simulation Rock				35				
						8 INCH PLUS		Jupe Quarry			
W-1300	Culvert energy dissipators (4)						4				
W-1300 Ext.	Culvert energy dissipators (3)						3				
W-1309	Culvert energy dissipator (1)						1				
						QUARRY SPALLS		Jupe Quarry			
*W-1300	78+30		Stream Simulation Rock				69				
						PIT RUN		Jupe Quarry			
*W-1300	78+30		Stream Simulation Rock				69				
	78+30		Curve Widening				59				
	76+20	79+50	1 ½:1	12	80	3.30	264				
	91+00	97+00	1 ½:1	12	80	6.00	480				
	94+00		Bridge Abutments				135				
	Culvert backfill (4)						65				
W-1300 Ext.	0+00	41+30	1 ½:1	12	63	41.30	2,602				
+	Landing						50				
+W-1307	0+00	5+77	1 ½:1	10	44	5.77	254				
+	Landing						50				
+W-1308	0+00	8+26	1 ½:1	10	44	8.26	363				
+	Landing						50				
+W-1309	0+00	3+00	1 ½:1	10	44	3.00	132				
+	Landing						50				
+W-1390	0+00	5+80	1 ½:4	10	44	5.80	255				
+	Landing						50				
+W-1390	5+80	13+71	1 ½:1	10	44	7.91	348				
+	Landing						50				
+W-1395	0+00	5+16	1 ½:1	10	44	5.16	227				
+	Landing						50				
						3 INCH MINUS CRUSHED		Jupe Quarry or any commercial source			
W-1300	94+00		Bridge abutments				11				

*Quantities combine to produce 2 ½ FOOT MINUS STREAM SIMULATION ROCK
+Optional Rock See clause 7.4.2-4

HEAVY LOOSE RIPRAP TOTAL 560 Cubic Yards
LIGHT LOOSE RIPRAP TOTAL 35 Cubic Yards
8 INCH PLUS TOTAL 8 Cubic Yards
QUARRY SPALLS TOTAL 69 Cubic Yards
REQUIRED PIT RUN TOTAL 3,724 Cubic Yards
OPTIONAL PIT RUN TOTAL 1,879 Cubic Yards
3 INCH MINUS CRUSHED TOTAL 11 Cubic Yards

ROCK LIST

SURFACE

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Total	Rock Source
			K1	B1				
					1 ½ INCH MINUS CRUSHED			Any commercial source
W-1300	78+30	Culvert bedding					550	
W-1300	94+00	Bridge abutments					10	
					2 ½ INCH MINUS CRUSHED			Jupe Quarry or any commercial source
W-1300	0+00	63+50		Spot rock			500	
	76+20	79+50	1 ½:1	6"	34	3.30	112	
	78+30	Curve widening					30	
	91+00	97+00	1 ½:1	6"	34	6.00	204	

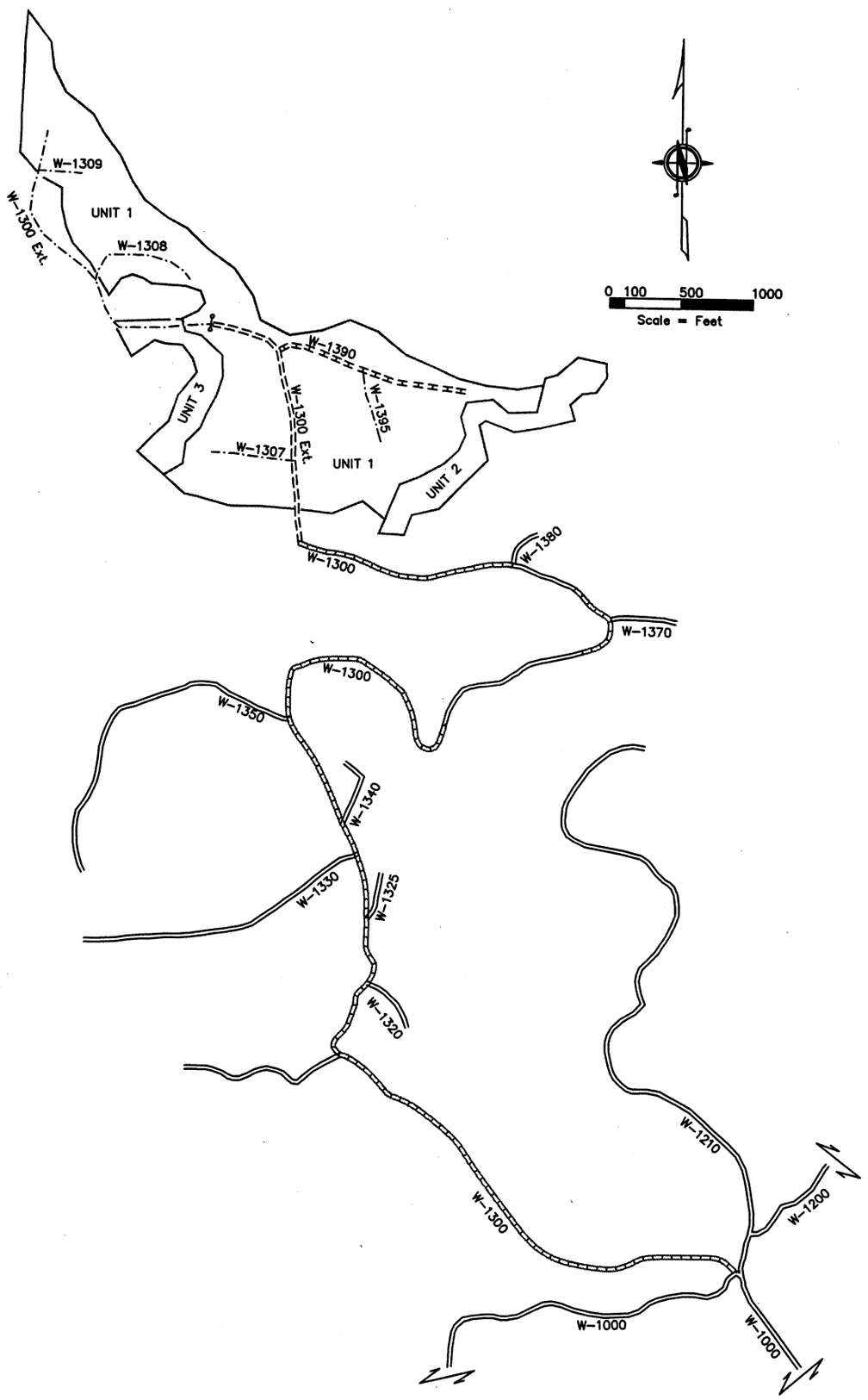
1 ½ INCH MINUS CRUSHED TOTAL 560 Cubic Yards
2 ½ INCH MINUS CRUSHED TOTAL 846 Cubic Yards

BRIGHT IDEA HARDWOOD

ROAD PLAN

OVERVIEW MAP

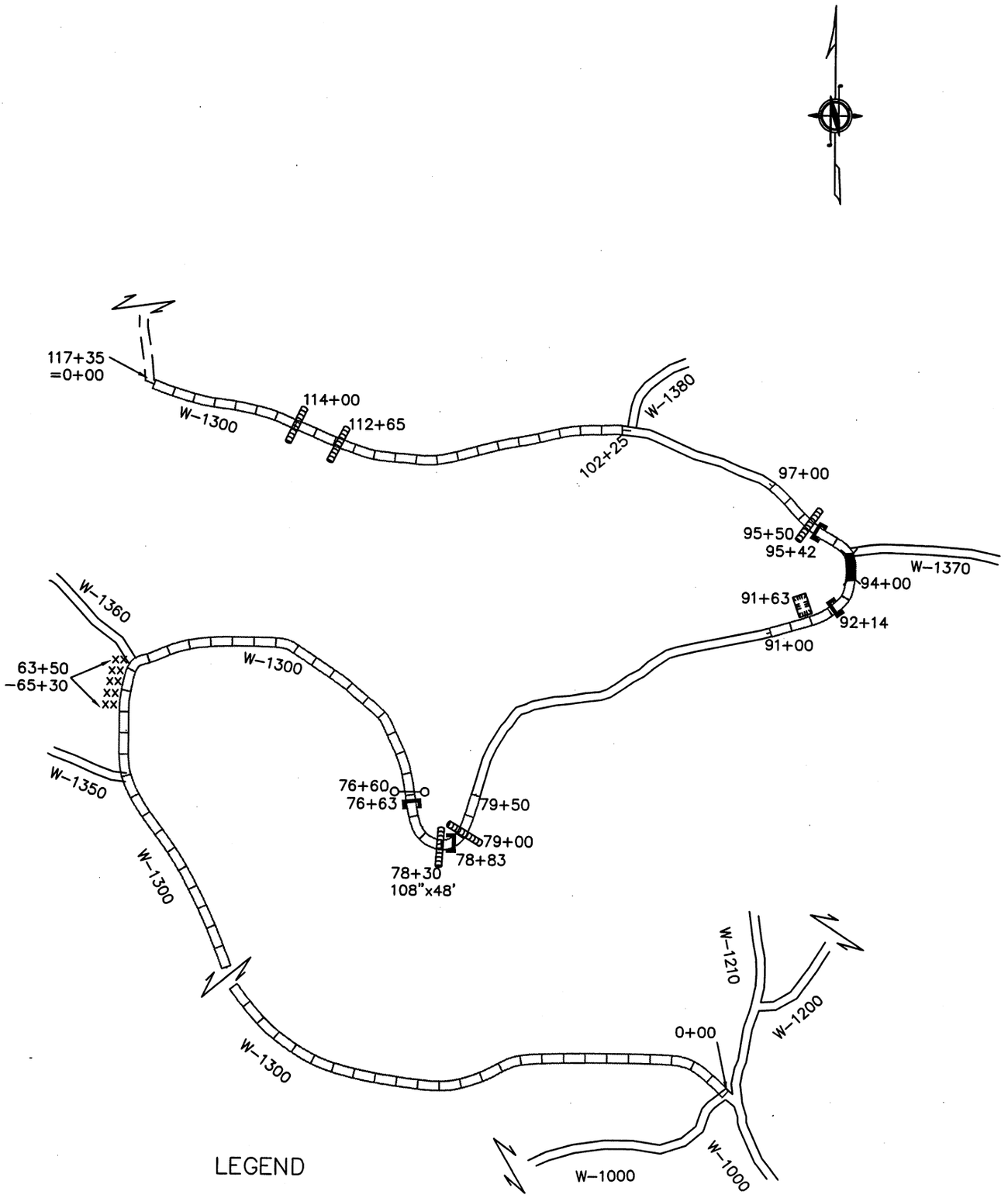
(Page 1 of 3)



BRIGHT IDEA HARDWOOD

ROAD PLAN MAP

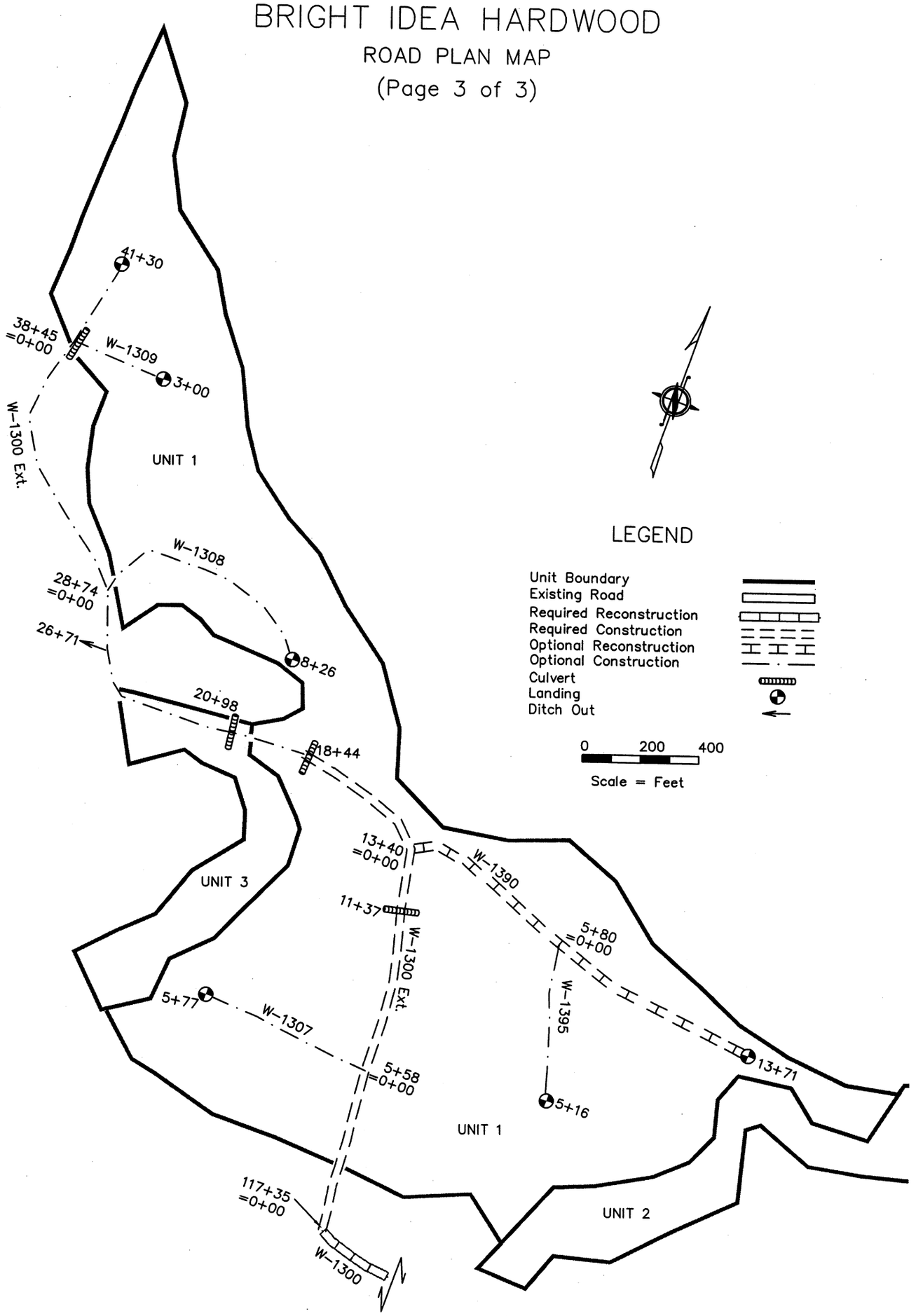
(Page 2 of 3)



BRIGHT IDEA HARDWOOD

ROAD PLAN MAP

(Page 3 of 3)



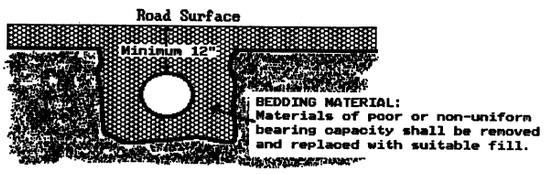
CULVERT LIST

Road Number	Location	Culvert Dia.	Culvert Gauge	Length (ft) Culvert	Downspt	Flume	Riprap (C.Y.) Inlet	Outlet	Type	Backfill Material	Quantity c.y.	Const. Staked	Remarks
			If Steel										
W-1300	78+30	108"	12	48	-	-	120	120	HL	1½	550	Yes	
	79+00	18"	-	32	-	-	½	½	8"	PR	15	-	
	95+50	18"	-	32	-	-	½	½	8"	PR	15	-	
	112+65	24"	-	34	-	-	½	½	8"	PR	20	-	
	114+00	18"	-	30	-	-	½	½	8"	PR	15	-	
W-1300 Ext.	11+37	18"	-	30	-	-	½	½	8"	NT	-	-	
	18+44	18"	-	28	-	-	½	½	8"	NT	-	-	
	20+98	18"	-	26	-	-	½	½	8"	NT	-	-	
W-1309	0+00	18"	-	30	-	-	½	½	8"	NT	-	-	

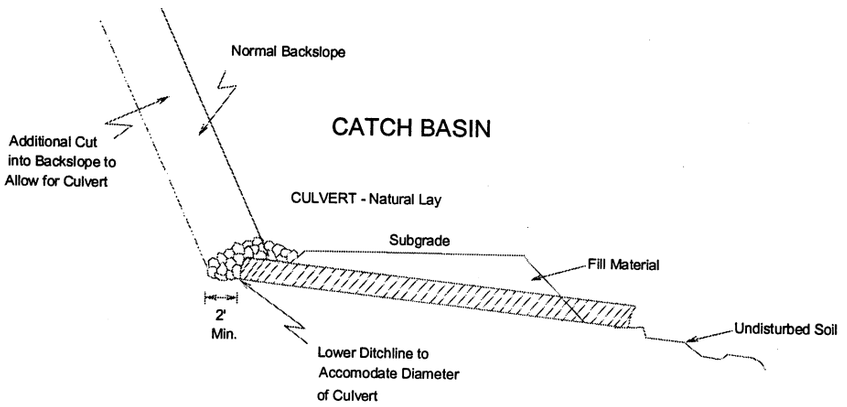
Key:

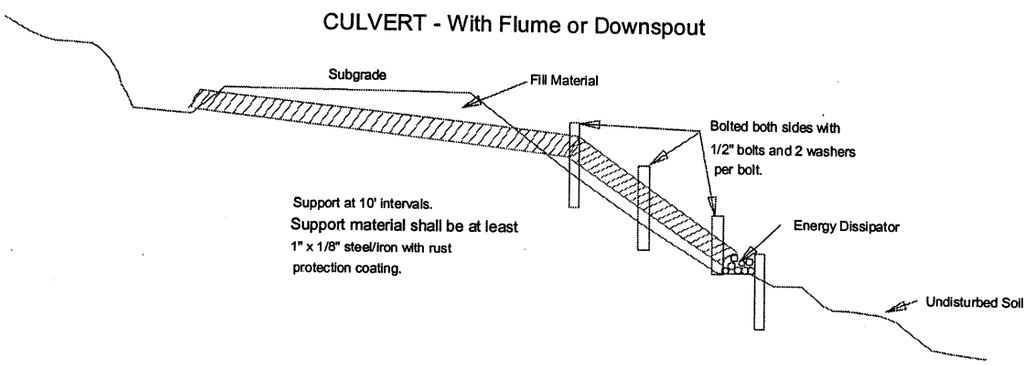
8" - 8 Inch Plus Rock
1½ - 1½ Inch Minus Crushed Rock
PR - Pit Run Rock
NT - Native (bank run)
SL - Select Fill
HL - Heavy Loose Riprap
LL - Light Loose Riprap
Flume - Half round pipe
Downspout - Full round pipe

CULVERT BACKFILL AND BASE PREPARATION
(For culverts less than 36")

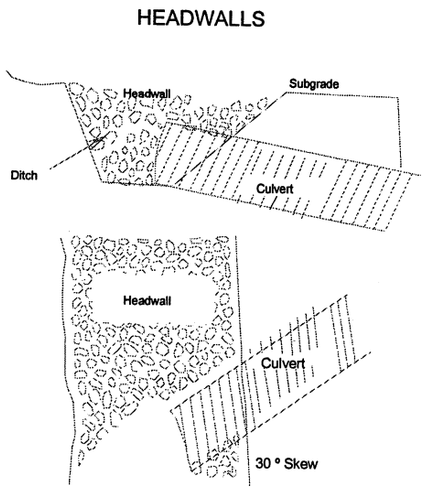


CULVERT AND DRAINAGE SPECIFICATION DETAIL

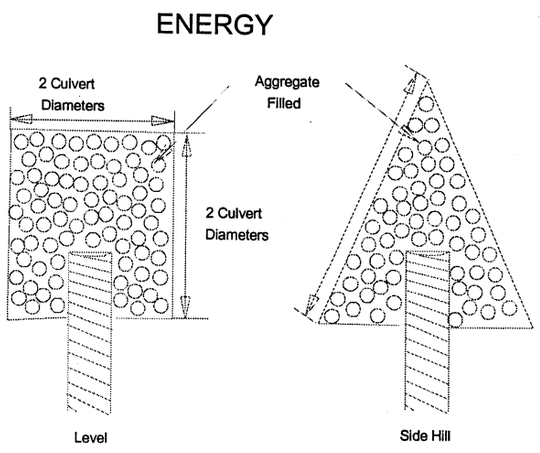




Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.



Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

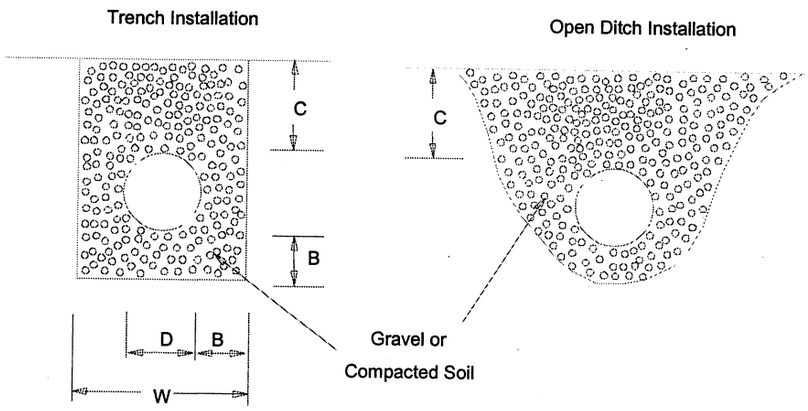
1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.

2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.

3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.

4. Site conditions and availability of bedding materials often dictate the type of installation method used.

5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills
   1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 12:1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
   2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
   3. Undesirable slide materials and debris shall not be mixed into the surface material.

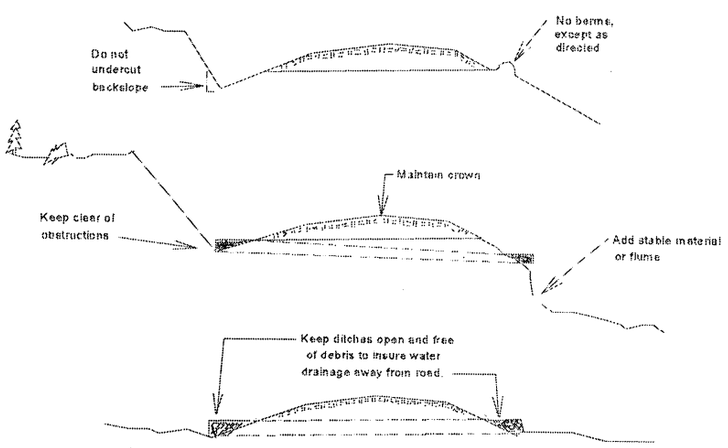
B. Surface
   1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
   2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
   3. Watering may be required to control dust and to retain fine surface rock.
   4. Desirable surface material shall not be bladed off the roadway.
   5. Replace surface material lost or worn away.
   6. Remove berms except as directed by the State.
   7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage
   1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
   2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
   3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
   4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
   5. Keep silt bearing surface runoff from getting into live streams.

D. Structures
   Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season
   Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

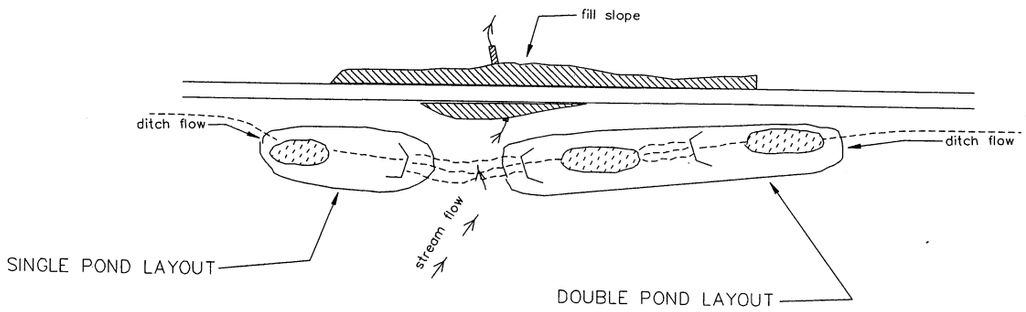
F. Debris
   Remove fallen timber, limbs, and stumps from the slopes or roadway.

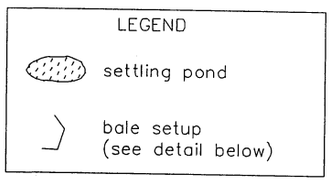


SETTLING POND DETAIL

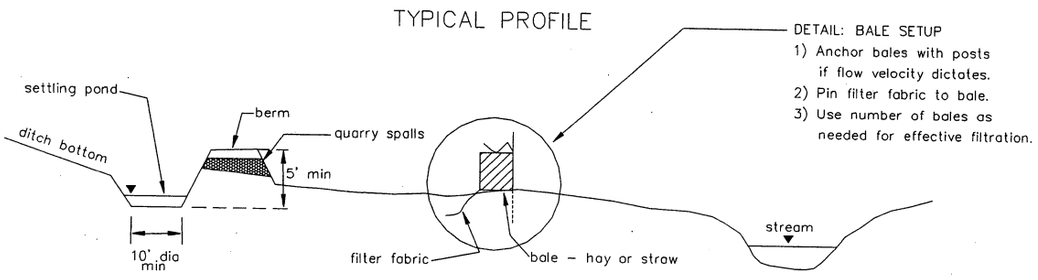
NO SCALE

TYPICAL PLAN VIEW

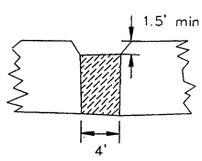




TYPICAL PROFILE



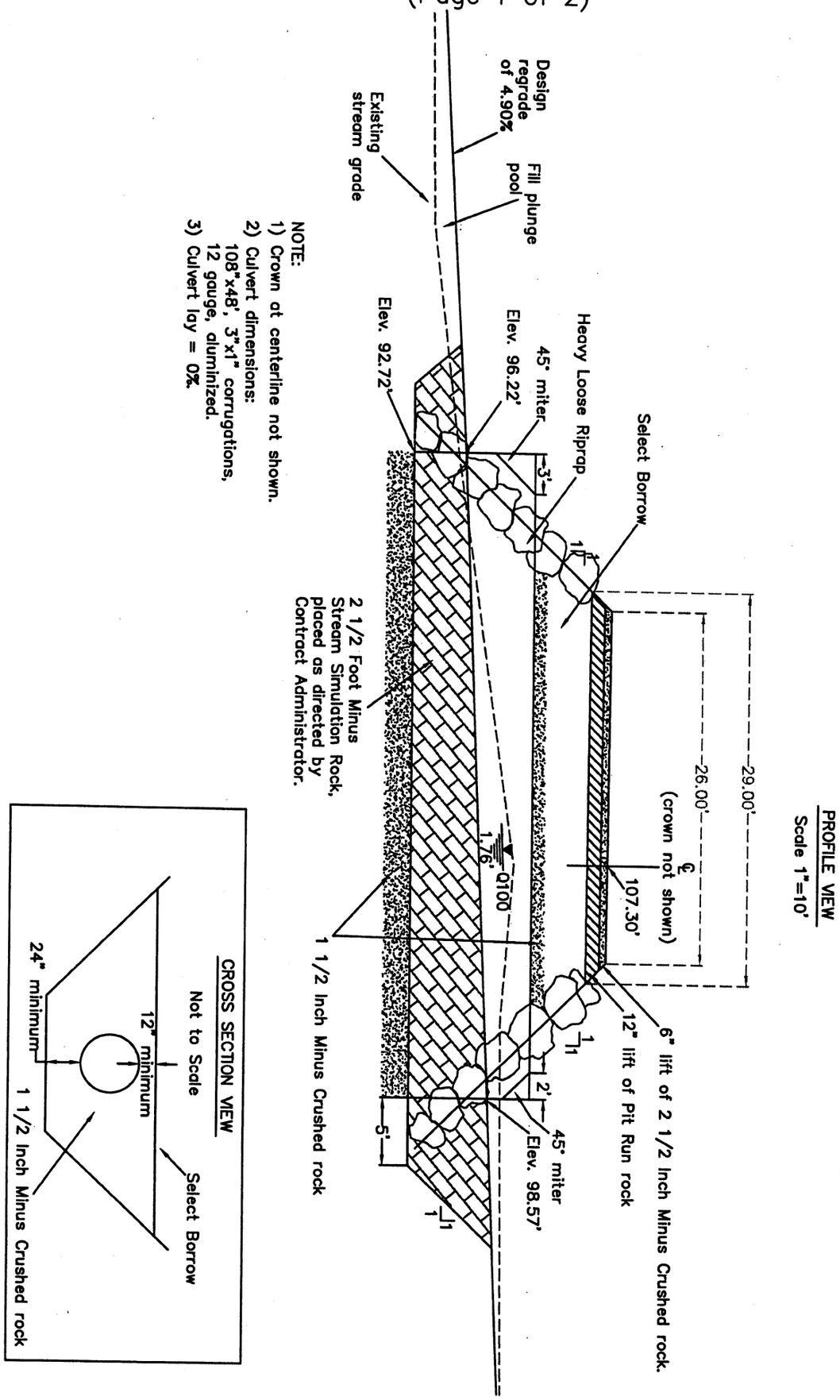
TYPICAL END VIEW OF OUTLET



CULVERT INSTALLATION DETAIL

W–1300 @ station 78+30

(Page 1 of 2)



Washington State Department of Natural Resources–Pacific Cascade Region	Date: February 25, 2004
	Designed by: Matthew T. Miskovic
Peer Review Initials/date: MM 3/1/04 CR 4/2/04 (Initials / Date / Intials / Date)	f:\engineer\sales\Bright Idea\culins W–1300 7830–1.dwg
	Drafted by: Alicia Compton

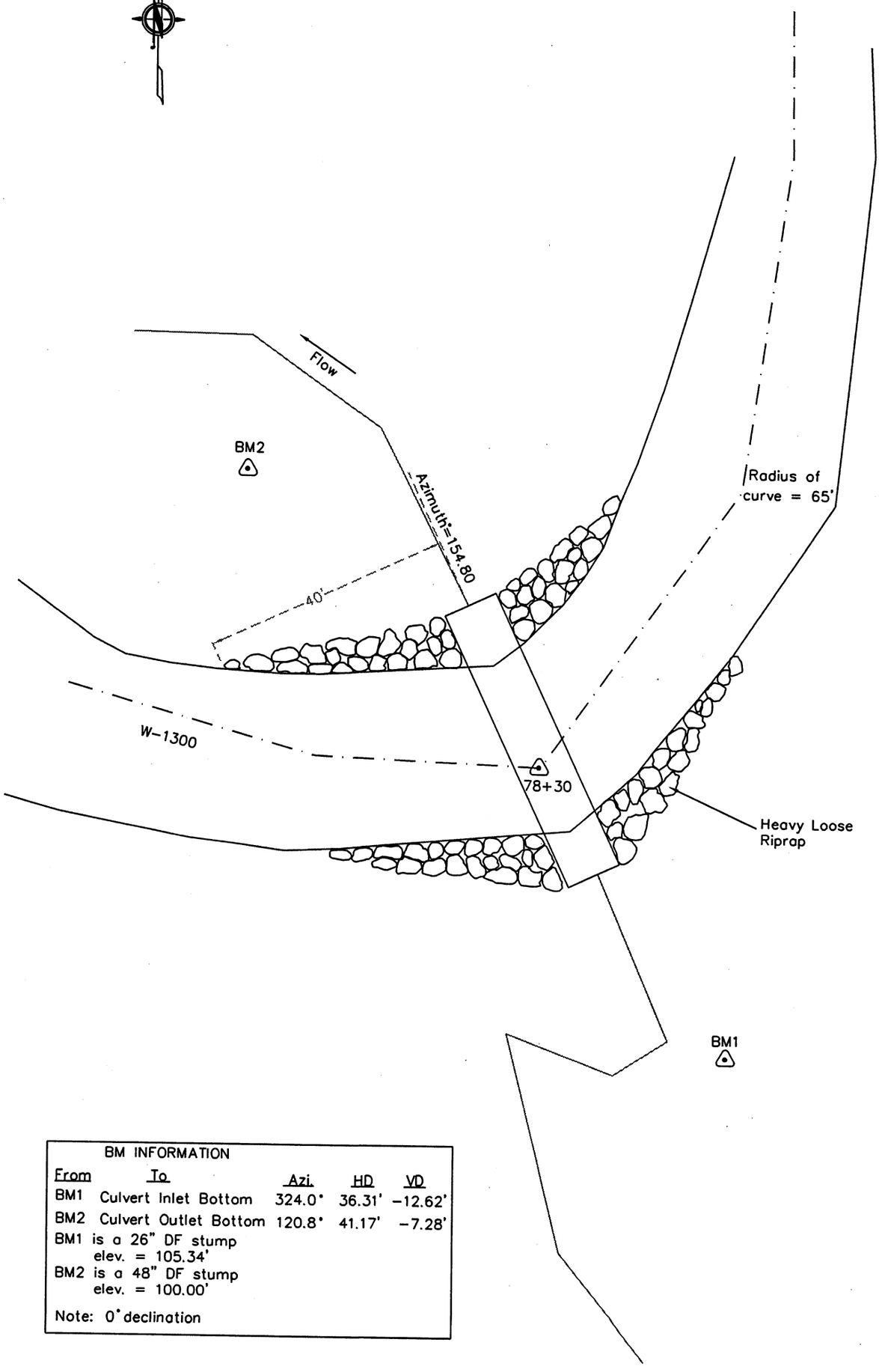
CULVERT INSTALLATION DETAIL

W-1300 road @ station 78+30

(Page 2 of 2)

PLAN VIEW

Scale 1"=20'



BM INFORMATION

From	To	Azi.	HD	VD
BM1	Culvert Inlet Bottom	324.0°	36.31'	-12.62'
BM2	Culvert Outlet Bottom	120.8°	41.17'	-7.28'

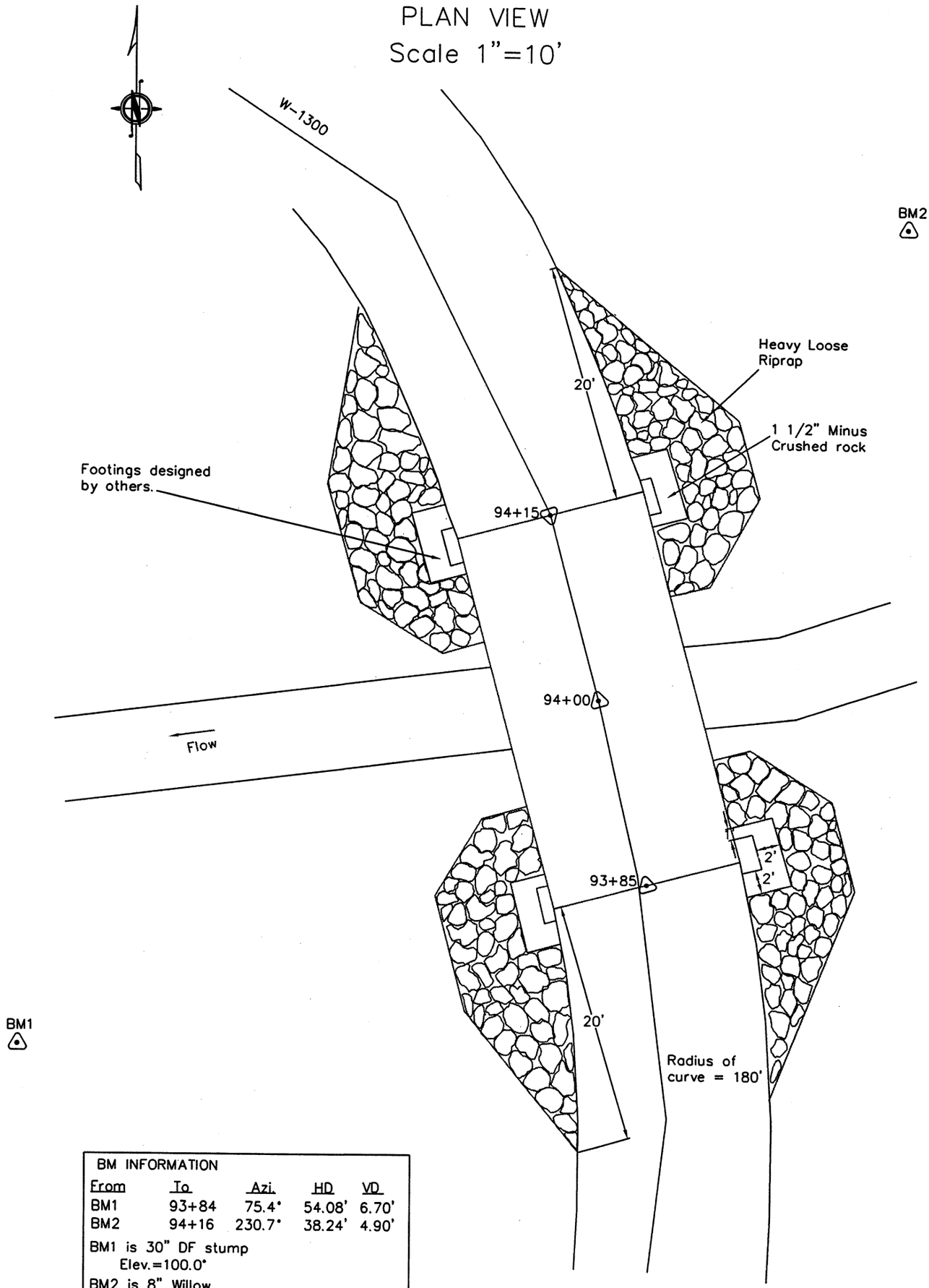
BM1 is a 26" DF stump
elev. = 105.34'

BM2 is a 48" DF stump
elev. = 100.00'

Note: 0° declination

BRIDGE INSTALLATION DETAIL
W–1300 @ station 94+00
(Page 1 of 2)

PLAN VIEW
Scale 1"=10'



BM INFORMATION				
From	To	Azi.	HD	VD
BM1	93+84	75.4°	54.08'	6.70'
BM2	94+16	230.7°	38.24'	4.90'

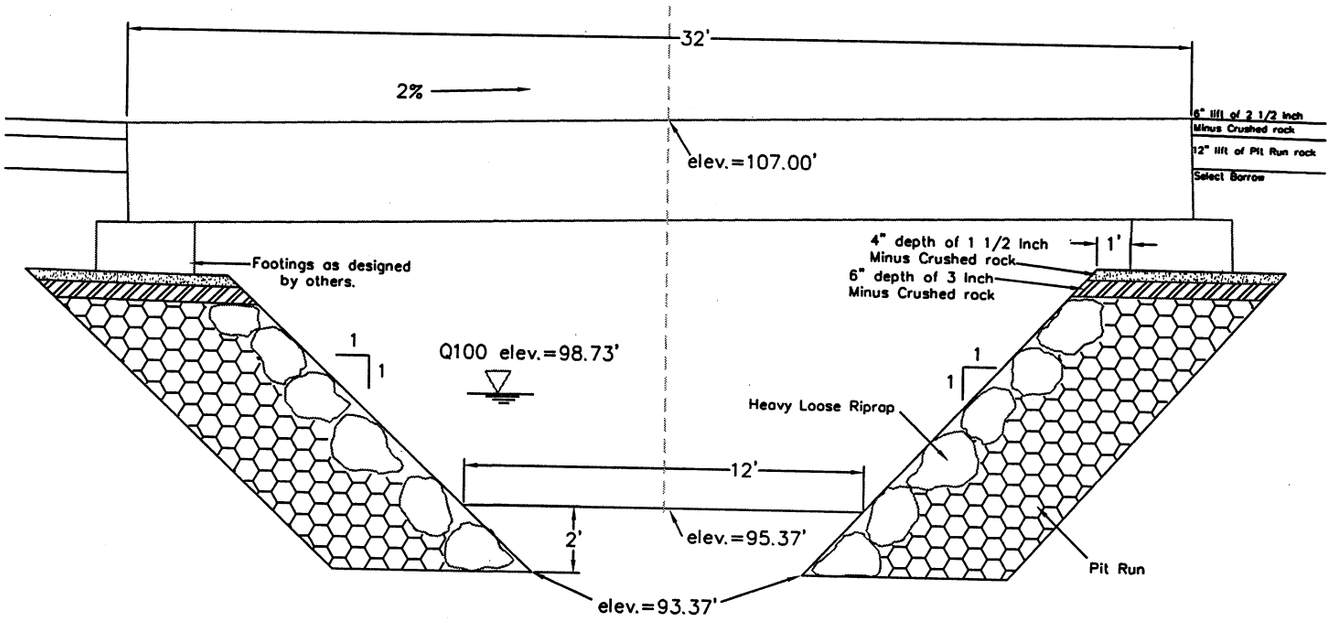
BM1 is 30" DF stump
Elev.=100.0'
BM2 is 8" Willow
Elev.=102.4'
Note: 0° declination

*Guard rails not shown for clarity.

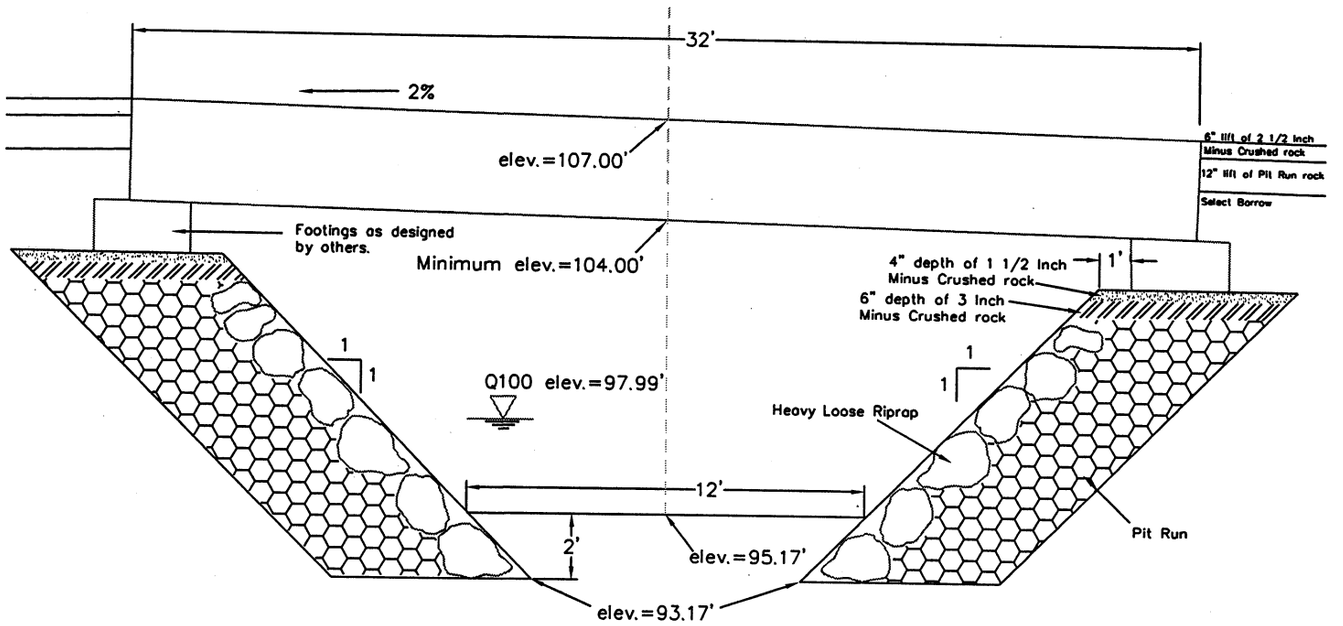
BRIDGE INSTALLATION DETAIL
W-1300 @ station 94+00
(Page 2 of 2)

Scale 1"=5'

VERTICAL CLEARANCE FROM UPSTREAM



VERTICAL CLEARANCE FROM DOWNSTREAM



NOTE: Guard rails not shown for clarity.

DEPARTMENT OF NATURAL RESOURCES - PACIFIC CASCADE REGION

FORM 9-87(Rev. 12-02)

SUMMARY - Road Development Costs

DISTRICT: Lewis

SALE/PROJECT NAME: Bright Idea Hardwood CONTRACT NUMBER: 36-076147

LEGAL DESCRIPTION: Sections 24 & 25 Township 12 North, Range 02 East W.M.

ROAD NUMBER:		W-1300	W-1300 extension	1307, W-1308, W-1309, W-1390, & W-13
ROAD STANDARD:		Mainline (14' R.S.)	Secondary Mainline (12' R.S.)	Spur road (10' R.S.)
NUMBER OF STATIONS:		100.60	41.30	35.90
SIDESLOPE:		0-5%	0-5%	0-5%
CLEARING AND GRUBBING:		$3,265	$6,443	$2,546
EXCAVATION AND FILL:		$27,360	$11,143	$2,932
ROCK TOTALS (Cu. Yds.):				
Riprap	595	$3,076	$0	$0
8" & QS	77	$436	$18	$6
Pit Run	5603	$6,882	$17,026	$12,063
3" Minus	11	$123	$0	$0
1 1/2" Minu	1406	$16,028	$0	$0
CULVERTS AND FLUMES:		$1,720	$1,021	$364
STRUCTURES:		$37,760	$0	$0
GENERAL EXPENSES:		$7,732	$1,861	$643
MOBILIZATION:		$750	$750	$750
TOTAL COSTS:		$105,132	$38,261	$19,304
COST PER STATION:		$1,045	$926	$538

NOTE: This appraisal has no allowance for profit and risk.

TOTAL (All Roads) = $162,697

SALE VOLUME MBF = 1,540

TOTAL COST PER MBF = $105.65

Plans to be furnished by:

Plan only: STATE

Plan-profile:

Compiled by: M. Miskovic Date: 03/01/04

Checked by: _____ Date: _____

Region Engineer: _____ Date: _____

Div of Engr.: _____ Date: _____

REMARKS: _____

_____

RoadCost

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Bright Idea Hardwood

CONTRACT NUMBER: 36-076147

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
W-1300	0-5%	35	1.00	1.25	$40	1.00	65.30	$3,265
	*0+00 to 65+30 clearing only						35.30	$0

Clear and Grub TOTAL = $3,265

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
W-1300	0-5%	1.00		$88	1.00	65.30	$0
	*Reconstruction - no excavation required					35.30	

*End Haul, Over Haul, Large Fills/Cuts

	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
78+30 CMP	500	4	$2,736	$10,944
94+00 Bridge	500	6	$2,736	$16,416

Excavation TOTAL = $27,360

III. BALLAST AND SURFACING :

Heavy Loose Riprap source:	Jupe Quarry
Light Loose Riprap source:	Jupe Quarry
8 inch Plus & Quarry Spalls	Jupe Quarry
Pit Run	Jupe Quarry
3 Inch Minus	Commercial
1 1/2 Inch Minus	Commercial

Description	Cubic Yards
Riprap	595.00
8" & QS	73.00
Pit Run	1072.00
3" Minus	11.00
1 1/2" Minus	1406.00

UNIT COSTS	Riprap	8" & QS	Pit Run	3" Minus	1 1/2" Minus
Drill & Shoot	$2.50	$2.50	$2.50		
Dig and load	$1.00	$1.00	$1.00		
Crushing					
Purchase				$7.25	$7.50
Haul *	$1.67	$1.67	$1.67	$2.65	$2.65
Spread		$0.80	$0.80	$0.80	$0.80
Compact			$0.45	$0.45	$0.45
Strip					
Reclamation					
TOTAL ($/cy)	$5.17	$5.97	$6.42	$11.15	$11.40

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

	Jupe	Commercial
R.T. Miles =	8.0	25
Avg. Speed =	25	40.0
Delay (Hrs.)=	0.2	$0.20
Cost / Hour =	$77.00	77
CY / Load =	24	24

Riprap	595 Cu. yds @	$5.17 /cu. yd =		$3,076
8" & QS	73 Cu. yds @	$5.97 /cu. yd =		$436
Pit Run	1072 Cu. yds @	$6.42 /cu. yd =		$6,882
3 Inch Minus	11 Cu. yds @	$11.15 /cu. yd =		$123
1 1/2 Inch Minus	1406 Cu. yds @	$11.40 /cu. yd =		$16,028

Rock total = $26,545

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter	No/Length	Installed Cost/ft	Sub-total
CPP	1	N/A	18	30	$11.80	$354
CPP	2	N/A	18	32	$11.80	$755
CPP	1	N/A	24	34	$16.70	$568

Bands & Gaskets 3 - 18" diameter bands @ $9.90 each	$30
1-24" diameter band @ $13.20 each	$13

Culvert total = $1,720

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total
	Fish pipe	108"	48	$120	$5,760
	Portable Bridge	14'	30	$900	$27,000
	Bridge footings				$5,000

Structure total = $37,760

Sub-TOTAL = $96,650

VI. GENERAL EXPENSES:

Overhead & General Exp. Add 8% $7,732

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	2	$200
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	1	$450
Dozer D8)	400	1	$400
Front end loader	400	1	$400
Rock crusher	$1,500		$0
Dozer (D5)	$240		$0

Total Mobilization = $2,250

Mobilization sub-total = $750

Road No. W-1300
Standard: Mainline (14' R.S.)
Stations: 100.60

SHEET TOTAL = $105,132

By: M. Miskovic

Date: 03/01/04

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Bright Idea Hardwood

CONTRACT NUMBER: 36-076147

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
W-1300 extension	0-5%	35	1.00	3.90	$40	1.00	41.30	$6,443

Clear and Grub TOTAL = $6,443

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
W-1300 extension	0-5%	1.00	2.50	$88	1.00	41.30	$9,086
Required Abandonment				$90		22.85	$2,057

*End Haul, Over Haul, Large Fills/Cuts

	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				
Large Fills/ Cuts				

Excavation TOTAL = $11,143

III. BALLAST AND SURFACING :

Heavy Loose Riprap source:	Jupe Quarry
Light Loose Riprap source:	Jupe Quarry
8 inch Plus & Quarry Spalls	Jupe Quarry
Pit Run	Jupe Quarry
3 Inch Minus	Commercial
1 1/2 Inch Minus	Commercial

Description	Cubic Yards
Riprap	0.00
8" & QS	3.00
Pit Run	2602.00
3" Minus	0.00
1 1/2" Minus	0.00

UNIT COSTS	Riprap	8" & QS	Pit Run	3" Minus	1 1/2" Minus
Drill & Shoot	$2.50	$2.50	$2.50		
Dig and load	$1.00	$1.00	$1.00		
Crushing				$7.25	$7.50
Purchase					
Haul *	$1.67	$1.67	$1.67	$2.65	$2.65
Spread		$0.80	$0.80	$0.80	$0.80
Compact			$0.45	$0.45	$0.45
Strip					
Reclamation					
TOTAL ($/cy)	$5.17	$5.97	$6.42	$11.15	$11.40

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

	Jupe	Commercial
R.T. Miles =	8.0	25
Avg. Speed =	25	40.0
Delay (Hrs.)=	0.2	$0.20
Cost / Hour =	$77.00	77
CY / Load =	24	24

Riprap	0	Cu. yds @	$5.17 /cu. yd =	$0
8" & QS	3	Cu. yds @	$5.97 /cu. yd =	$18
Pit Run	2652	Cu. yds @	$6.42 /cu. yd =	$17,026
3 Inch Minus	0	Cu. yds @	$11.15 /cu. yd =	$0
1 1/2 Inch Minus	0	Cu. yds @	$11.40 /cu. yd =	$0

Rock total = $17,044

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
	1	N/A	18	26	$11.80	$307
	1	N/A	18	28	$11.80	$330
	1	N/A	18	30	$11.80	$354
Bands & Gaskets		3 - 18" diameter @ $9.90each				$30

Culvert total = $1,021

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total

Structure total = $0

Sub-TOTAL = $18,607

VI. GENERAL EXPENSES:

Overhead & General Exp. Add 10% $1,861

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	$100	2	$200
Grader	$400	1	$400
Compactor	$400	1	$400
Excavator	$450	1	$450
Dozer D8)	$400	1	$400
Front end loader	$400	1	$400
Rock crusher	$1,500	0	$0
Dozer (D5)	$240	0	$0

Total Mobilization = $2,250

Mobilization sub-total = $750

Road No. W-1300 extension
Standard: Secondary Mainline (12' R.S.)
Stations: 41.30

SHEET TOTAL = $21,217

By: M. Miskovic

Date: 03/01/04

PACIFIC CASCADE REGION - ROAD COST ESTIMATE

SALE NAME: Bright Idea Hardwood

CONTRACT NUMBER: 36-076147

I. CLEARING AND GRUBBING:

Flat Rate -	% Side Slope	MBF/ac	Disposal Factor	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
W-1307	0-5%	35	1.00	2.77	$32	0.80	5.77	$409
W-1308	0-5%	35	1.00	2.77	$32	0.80	8.26	$586
W-1309	0-5%	35	1.00	2.77	$32	0.80	3.00	$213
W-1390	0-5%	35	1.00	2.77	$32	0.80	13.71	$972
W-1395	0-5%	35	1.00	2.77	$32	0.80	5.16	$366

Clear and Grub TOTAL = $2,546

II. EXCAVATION:

Flat Rate -	% Side Slope	Exc. Type Fact.	Production Factor	Cost/ Station	Width Factor	Total Stations	Sub Total
W-1307	0-5%	1.00	2.00	$66	0.50	5.77	$381
W-1308	0-5%	1.00	2.00	$66	0.50	8.26	$545
W-1309	0-5%	1.00	2.00	$66	0.50	3.00	$198
W-1390	0-5%	1.00	2.00	$66	0.50	13.71	$905
W-1395	0-5%	1.00	2.00	$66	0.50	5.16	$341
Required Abandonment				$50		11.26	$563

*End Haul, Over Haul, Large Fills/Cuts	Estimated Vol. (cy)	No. of Equip. Days	Cost/day	Sub Total
End Haul/ Over Haul				
Large Fills/ Cuts				

Excavation TOTAL = $2,932

III. BALLAST AND SURFACING :

Heavy Loose Riprap source:	Jupe Quarry
Light Loose Riprap source:	Jupe Quarry
8 inch Plus & Quarry Spalls	Jupe Quarry
Pit Run	Jupe Quarry
3 Inch Minus	Commercial
1 1/2 Inch Minus	Commercial

Description	Cubic Yards
Riprap	0.00
8" & QS	1.00
Pit Run	1579.00
3" Minus	0.00
1 1/2" Minus	0.00

UNIT COSTS	Riprap	8" & QS	Pit Run	3" Minus	1 1/2" Minus
Drill & Shoot	$2.50	$2.50	$2.50		
Dig and load	$1.00	$1.00	$1.00		
Crushing				$7.25	$7.50
Purchase					
Haul *	$1.67	$1.67	$1.67	$2.65	$2.65
Spread		$0.80	$0.80	$0.80	$0.80
Compact			$0.45	$0.45	$0.45
Strip					
Reclamation					
TOTAL ($/cy)	$5.17	$5.97	$6.42	$11.15	$11.40

* Haul Formula: (R.T.Miles/MPH+Delay)($/hr / Cy/load)

	Jupe	Commercial
R.T. Miles =	8.0	25
Avg. Speed =	25	40.0
Delay (Hrs.)=	0.2	$0.20
Cost / Hour =	$77.00	77
CY / Load =	24	24

Riprap	0	Cu. yds @	$5.17 /cu. yd =	$0
8" & QS	1	Cu. yds @	$5.97 /cu. yd =	$6
Pit Run	1879	Cu. yds @	$6.42 /cu. yd =	$12,063
3 Inch Minus	0	Cu. yds @	$11.15 /cu. yd =	$0
1 1/2 Inch Minus	0	Cu. yds @	$11.40 /cu. yd =	$0

Rock total = $12,069

IV. CULVERTS AND FLUMES:

Description	Qty.	Gauge	Diameter (in.)	No/Length (ft)	Installed Cost/ft	Sub-total
	1	N/A	18	30	$11.80	$354
Bands & Gaskets	1 - 18" diameter band @ $9.90 each					$10

Culvert total = $364

V. STRUCTURES

Description	Type	Width	Length	Cost/ft.	Sub-total

Structure total = $0

Sub-TOTAL = $5,842

VI. GENERAL EXPENSES:

Overhead & General Exp. Add 11% $643

VII. MOBILIZATION:

* Move in costs are averaged over all three sheets.

Description	$ per Move	# of Moves	Sub-total
Dump Trucks	100	2	$200
Grader	400	1	$400
Compactor	400	1	$400
Excavator	450	1	$450
Dozer D8)	400	1	$400
Front end loader	400	1	$400
Rock crusher	$1,500	0	$0
Dozer (D5)	$240	0	$0

Total Mobilization = $2,250

Mobilization sub-total = $750

Road No. W-1300 extension
Standard: Secondary Mainline (12' R.S.)
Stations: 24.97

SHEET TOTAL = $7,235

By: M. Miskovic

Date: 03/01/04